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## DOUBLE-FLOW EXHAUST SYSTEM FOR AN INTERNAL-COMBUSTION ENGINE

The invention relates to a double-flow exhaust system for an internal-combustion engine, according to the preamble of Claim 1.

From German Patent Document DE 199 32 349 A1, a double-flow exhaust system of a motor vehicle is known whose two exhaust lines are guided together at the end into a common end muffler housing. A tail pipe, by way of which the exhaust gases are discharged to the outside, is fastened to the end muffler housing. As illustrated in Figure 1 of German Patent Document DE 199 32 349 A1, each exhaust line consists of several assemblies, such as the exhaust gas elbow, the catalyst and the end muffler which are assembled by way of corresponding exhaust pipes and flange-type connections.

It is an object of the invention to further develop the assemblies of the exhaust system such that, on the one hand, the free installation space in the area of the exhaust tail pipe is increased and, on the other hand, the mounting of the entire exhaust system is facilitated.

This object is achieved by means of the characteristics

indicated in Claim 1.

As a result of the fact that the two exhaust lines each have a separate end muffler, which both are fluidically connected by way of at least one mountable connection pipe, the space obtained between the two faces can be utilized for placing and developing the exhaust tail pipe. Furthermore, by separating the two exhaust lines in the area of the end muffler, it becomes possible to assemble the individual exhaust line as a preassembled constructional unit in order to then complete it on the vehicle to form the entire exhaust system. By separating the U-shaped entire exhaust system in the area of the end muffler, a transport of the preassembled constructional unit also becomes possible without any problem.

By means of the characteristics and measures indicated in the subclaims, additional advantageous embodiments and further developments of the exhaust system can be obtained.

A first connection of the two end mufflers takes place by means of a T-pipe piece which, by means of its two first pipe ends, is connected with the two end mufflers, while the third pipe end is used as an exhaust gas outlet. In this case, a tail pipe with a tail pipe cover is mounted on the third pipe end of the T-piece.

Advantageously a second connection pipe between the two end mufflers contributes to the muffling of noise, particularly of the low-frequency fractions in the low rotational speed range. Simultaneously, a torque increase is obtained in the low rotational speed range. In this case, the course and the position in the rotational speed band of the torque increase and of the noise muffling can be significantly influenced by means of the targeted adaptation of the pipe length and of the pipe cross-section.

The mountable second connection pipe consists of two connecting pieces connected with the respective end muffler housing, onto which connecting pieces a sliding sleeve is pushed and whose axial positioning or securing can be achieved, for example, by means of a clamp.

The drawing illustrates an embodiment of the invention which will be described in detail in the following.

Figure 1 is a top view of an exhaust system;

Figure 2 is a perspective frontal view of the exhaust system, and

Figure 3 is a perspective rear view of the exhaust system.

The double-flow exhaust system for a 6-cylinder engine has one exhaust elbow 2 and 4 respectively which is in each case fastened by means of its flange section 6 and 8 respectively on the cylinder head of an engine unit which is not shown. The three individual pipes of the exhaust manifold 2 and 4 lead into one exhaust gas collecting pipe 10 and 12 respectively which is adjoined by a housing 14 and 16 respectively of a starting catalyst. One exhaust pipe 18 and 20 respectively is connected to the two starting catalysts 14, 16 by means of a detachable flange connection 19, which exhaust pipes 18, 20 each lead to one housing 22 and 24 respectively in which a main catalyst is accommodated. The two main catalysts 22, 24 are each accommodated in an end muffler housing 26 and 28 respectively or are partially integrated therein. Both end muffler housings 26 and 28 are fluidically connected with one another by way of a first connection pipe 30, in the following called lower connection pipe. In this case, the lower connection pipe 30 is constructed as a T-pipe piece on whose free connecting piece an exhaust pipe cover 34 is fastened, while the connecting pieces are fitted onto a pipe connecting piece of the respective end muffler housing 26, 28 and are secured by means of two fastening clamps 34. A second connection pipe 36, in the following called an upper connection pipe 36, extends above the lower connection

pipe 30 and consists of two connecting pieces 36a and 36b extending out of the respective end muffler housing 26 and 28. The two ends of the connecting pieces 36a, 36b are spaced away from one another while being aligned with respect to one another on the face-side. The forming gap a is covered by a sliding sleeve 36 (shown only in Figure 1) which is axially secured by means of clamps which are not shown. Thus, by means of the two connecting pieces 36a, 36b and the mountable sliding sleeve 36c, a second gastight connection is established between the two end muffler housings 26 and 28 by means of the connection pipe 36.

For the suspension or fastening of the entire exhaust system, a fastening device 38 is provided which has a carrier plate 40 fastenable to a transmission. A lower pipe stay 42 is fastened to the carrier plate 40, to the left and right supporting leg 42a and 42b respectively of the pipe stay 42, one fastening clamp 44 and 46 respectively being provided which reaches around the housing of the starting catalyst 14 and 16 respectively. The lower pipe stay 42 is supported by two tension struts 48 and 50 elastically disposed on the carrier plate 40.